Annual Report 2000

Innovation and Service Beyond Expectation

Our Mission

We provide services to the transportation community through research, technology transfer, and education. We create and participate in partnerships to promote safe and effective transportation systems.

We Value . . .

Teamwork--listening and communicating along with courtesy and respect for others.
Honest and ethical behavior.
Delivering the highest quality products and services.
Continuous improvement in all that we do.

Kentucky Transportation Center
176 Raymond Building
University of Kentucky
Lexington, KY 40506-0281

VOICE: (859) 257-4513
1-800-432-0719
FAX: (859) 257-1815
INTERNET:
http://www.engr.uky.edu/ktc

From the Director

Paul Toussaint
Director, Kentucky Transportation Center

We put together our strategic plan and mission statement for the Center a few years back and our vision, simply put, became ***Innovation and Service Beyond Expectation.*** *This brief, alternate-year annual report has* ***innovation*** *as its theme. What do we mean? It is said that we make progress by invention, innovation, and deployment. Innovation develops new scientific knowledge (invention) into something useful. It may be relatively expensive but, through deployment, holds the promise of making dramatic improvement in the materials, methods, and techniques of transportation. At the Center, we are striving for innovation beyond expectation. Our projects highlighted in this annual report demonstrate the range of our challenge.*

From the Secretary of Transportation

James C. Codell III
Kentucky Transportation Secretary

We've formed a unique partnership with the Kentucky Transportation Center at the University of Kentucky that provides hands-on experience for university students, builds research expertise, and creates useful results.

We have altered our partnership in a manner that encourages everyone to think "outside-the-box" to increase the efficiency and effectiveness of transportation in Kentucky. The deployment of change and subsequent improvement can be expected to produce very positive results in Kentucky.

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Innovative Contracting I-275

David L. Allen (859-257-4513 ext. 250)

The Center has assisted the Kentucky Transportation Cabinet in the development of new specifications for warranty pavement construction. This warranty allowed two industries to competitively bid on a warranted pavement rehabilitation project. The contractors were permitted to bid a 5- to 10-year warranty and receive credit based on the length of warranty toward the evaluation of the final bid. The Center will be responsible for monitoring the pavement structure and accumulated traffic during the warranty period. This project is one of the first in the country to use this concept in the evaluation of competitive bids.

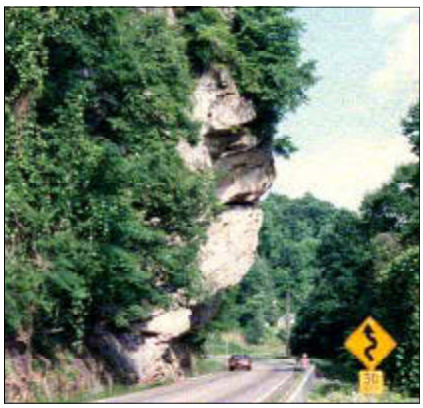
Improvement in Bridge Painting

Theodore Hopwood II (859-257-2501)

The Kentucky Department of Highways (KYDOH) and the Center have cooperated over the past 10 years to advance the state of the art of bridge painting. To help accomplish their goals, they formed the KYDOH Paint Team, a multi-disciplinary group that includes representatives from the KYDOH Divisions of Environmental Analysis, Materials, Operations, Planning, and Worker Safety, and Center researchers. Bridge painting projects experiment with specific approaches to painting that "best" fit the needs at hand. Small changes in painting practices are tested and those proving successful are subsequently used on future projects. This incremental improvement process has led to significantly better bridge painting projects over the past 10 years.

The Paint Team also has developed a quality control/quality assurance program that requires painting contractors to provide better workmanship.

Containment enclosure is used to prevent releases of dust and paint overspray into the environment on the US 25 (Clay Wade Bailey) Bridge at Covington.



Geotechnical Information System

Tommy Hopkins (859-257-4513 ext. 249)

A geotechnical data base is being developed in a client-server environment. All highway district offices and the Divisions of Materials' and Operations' central offices are connected to the data base. The data base consists of three components:

- Rockfall Sites
- Landslide Sites
- Soil and Rock Engineering Data

Interactive applications, such as retaining wall designs and pavement design programs, will be incorporated into the data base. On-line analyzers for statistical analyses of data and related graphs will be programmed.

Methods will be developed for inputting historical geotechnical records for analysis as well as procedures for capturing, in a "real-time" mode, geotechnical data as it is generated.

Nighttime Construction

Donn Hancher (859-257-4857)

There is an increasing demand for performing transportation-related construction and maintenance operations at night, especially in urban areas, to reduce conflicts with the traveling public. The goal of this study was to provide the Kentucky Transportation Cabinet with a base of knowledge for determining when and how to successfully use nighttime construction practices for its highway construction projects. Seventeen specific recommendations have been proposed. These cover several issues related to nighttime work, including contract requirements, traffic control, law enforcement, personnel issues, lighting, and public awareness. Also, a method was developed for evaluating a proposed construction project as a candidate for nighttime work.

Technology Transfer

Patsy Anderson (859-257-4513 ext. 229)

This year, the Technology Transfer (T^2) Unit provided the following services to help optimize Kentucky's transportation system: (1) *training included workshops, seminars, conferences, and teleconferences,* (2) *tried and true methods, innovations and new information for maintaining highways,* (3) *on-site technical assistance*, (4) *an information service featuring a state-of-the-art transportation library*, (5) *publications included newsletters, directories, and training manuals*, and (6) *a toll-free number for client use.*

Training

Attendance at the Center's 111 workshops/training sessions across the state included 4,027 individuals from governmental agencies and the transportation industry.

This year, 142 individuals completed the Roads Scholar Training Program bringing the total number of Roads Scholars to 472. Seventy of those Roads Scholars completed the additional training program to become the first Road Masters.

New training courses offered included *Environmental Awareness* and *Snow and Ice Removal*. Engineers and other professionals from the Center developed and presented nine *Thinking Beyond the Pavement* training classes.

T^2 presented several teleconference courses this year. Also, on-demand training has increased significantly. These courses are available on-site upon the request of an agency providing a minimum number of participants.

A schedule of training courses is listed in each issue of the Center's quarterly newsletter and on the Center's web site. A hard-bound calendar also is published that lists training activities a year in advance.

Library Facts

Visitors	4,696
Materials Circulated	1,121
Videos Circulated	*457*
Reference Questions Answered	609
New Materials Added	838
New Videos	*100*

Publications

Four issues of *The Link* included a special feature on the Library. Other topics addressed included: safety, whitetopping, roadside vegetation, center/edge line striping regulations, drainage, transit, rails-to-trails and sister city projects, and the Kentucky's new graduated driver's licensing.

Website

The newly designed web site (http://www.engr.uky.edu/ktc--*click on Technology Transfer)* offers easy access to the training calendar, publications, and library information.

Intelligent Transportation Systems

Joe Crabtree (859-257-4513 ext. 241)

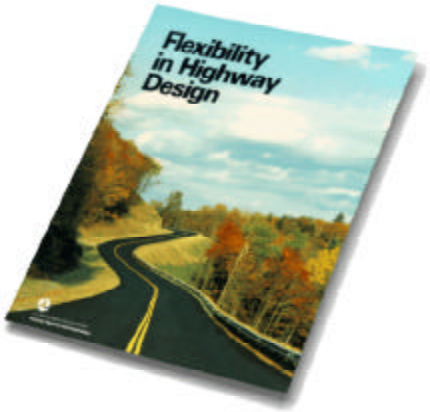
Center researchers are developing an integrated, regional Intelligent Transportation Systems (ITS) deployment plan for the Cumberland Gap Tunnel and surrounding areas along the US 25 E corridor. The affected region includes southeastern Kentucky, northeastern Tennessee, and southwestern Virginia.

Information from key stakeholders within the region will be used to identify primary ITS initiatives for the Cumberland Gap Tunnel. Possible ITS initiatives include highway advisory radio, traveler information systems, variable message signs, and other ITS applications included in the range of the ITS User Services as defined in the U.S. Department of Transportation, Federal Highway Administration's National ITS Architecture. The final Cumberland Gap ITS plan will be deployed with TRW working in conjunction with the Kentucky Transportation Cabinet and the Center.

Context-Sensitive Design

Jerry G. Pigman (859-257-4513 ext. 252)

Context-sensitive design is a collaborative approach to designing highways that focuses on purpose and need while giving equal attention to safety, mobility, and preservation of the natural and human environment. Use of a multi-disciplinary team, with public involvement as an integral part of project development, attempts to assure that projects will be in harmony with and contribute lasting value to the community. Highway designers, in cooperation with the project development team, are encouraged to be creative and incorporate flexibility tailored to the needs of a specific project. This concept is based on previously developed principles and commitments to preserving and protecting environmental and cultural values affected by transportation facilities.



Visit the Center on UK's Lexington campus or surf our web site: http://www.engr.uky.edu/ktc

Bridge Composites

Issam Harik (859-257-4513 ext. 273)

The research activities conducted in *Fiber Reinforced Polymer (FRP) Composites* focus primarily on bridges and bridge components. Various FRP bridge decks were tested in the laboratory and compared with standard steel reinforced concrete (R/C) panels. The FRP panels surpassed the R/C panels in load capacity and deflection limitations. The advantage of the FRP panels lies in the rapid replacement of bridge decks, and in longer service life.

Laboratory testing was conducted on bridge deck panels reinforced with steel and/or glass FRP rebars to generate design guidelines. The FRP rebars were later deployed in the Roger's Creek Bridge in Bourbon County. Advance FRP composites also are being deployed in a non-magnetic US-NAVY platform.

This project illustrates the value of research by transferring aerospace technology to infrastructure applications leading to an economical solution to a complex construction project. Implementation of the Center's research findings lead to safer bridges and to highly cost-effective investments of public funds.

Transportation and the Community

Ted Grossardt (859-243-0971 ext. 25)

This project will first test, then create a guide to the use of visualization technologies in aiding community input for transportation design decisions. Researchers are involving a local focus group in testing the usefulness of different visualization technologies for improving their understanding and input into a sample highway design problem. Focus group members will be able to "walk around" or "drive through" the virtual design to examine its features and assess its impact on the landscape and the roadway functionality. Researchers hope to extend these insights to other kinds of public infrastructure participatory design.

Financial Snapshot

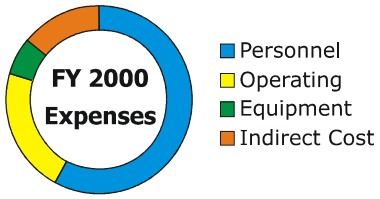
Kentucky Transportation Center

FY00 Expenditures*

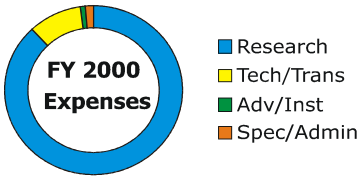
Program Area	Research**	Technology Transfer	Advanced Institute	Special Administration	Total
Category of Expense:					
Personnel	3,086,620	283,216	62,952	65,198	3,497,986
Operating	979,685	305,399	5,881	24,306	1,315,271
Equipment	382,469	-0-	-0-	-0-	382,469
Indirect Costs	861,646	-0-	2,032	-0-	863,678
Total Program	5,310,420	588,615	70,865	89,504	6,059,404

*Expenditure detail by subcategory of expense is available on request (1-800-432-0719) or on the Center's Web Site: www.engr.uky.edu/ktc/

**The research/study program for FY00 consisted of over 100 projects conducted for the following agencies: the Kentucky Transportation Cabinet, Kentucky State Police, USDOT/FHWA, USDOT/FMCSA, and various private firms. Some work is done in cooperation with other universities including: Northwestern, UT/Knoxville, Georgia Tech and Johns Hopkins; and also in partnership with private firms including TRW and Booz-Allen-Hamilton.



Distribution by Category of Expense



Distribution by Program Area

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176 Raymond Building
University of Kentucky
Lexington, KY 40506-0281